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2010 Shareholder's Report



National Weather Service, La Crosse, WI

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Your Local National Weather Service: How Can We Help You?

Welcome to the fourth edition of the National Weather Service (NWS) La Crosse Shareholder's Report. This report is intended to highlight the service and information provided by NWS La Crosse personnel, as well as our current and planned efforts to enhance those same services. I hope you find this report both informative and useful.

Last year in this space, I highlighted the NWS La Crosse Mission Statement, which reads:

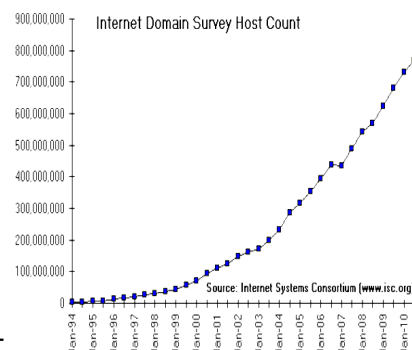
"Dedicated to continuous improvement in the provision of high quality weather-related warning, forecast and educational information for the safety and overall benefit of the citizens we serve."

Our focus has not changed. In fact, even more now than ever, we and our agency are working to find ways to improve the value of the information we provide to the many weather-sensitive sectors of our society, including the general public.

The NWS Mission has not changed, The NWS La Crosse Mission has not changed. But the environment in which we provide our services is evolving rapidly.

As demonstrated in the figure shown (right), the internet has enabled an explosion of instantly available information for the public. In concert with that information availability, we are all learning how much benefit can be realized by making the information available to the right people at the right time and in the right way. Our challenge is identifying what that information is, who those people are, and when and how they need it.

Our agency (and our office) are working to utilize technology, including social media, to enhance our support to our partners and customers. Our continued goal is to identify new areas and ways in which we can improve the information we provide, its timeliness, and how well it meets our partner and customer needs.



Number of internet host sites:
growing at 75 million per year

I hope you find our work demonstrates the sort of stewardship you expect from your public servants. I welcome your comments regarding how we can provide better weather information - whenever, wherever and however you need it!

Glenn R. Lussky
Meteorologist in Charge (MIC)

Turn Around - Don't Drown!

Motorists traveling in northeast Iowa on 260th Street, where it eventually crosses the Wapsipinicon River, have something new to see these days. Yellow "Turn Around Don't Drown" (TADD) signs have been posted to warn them not to drive across the road when it is covered with water.

This specific location in Iowa, along with several others in Chickasaw County, Iowa and

Juneau County, Wisconsin, were selected because they are highly traveled roads which have a relatively high frequency of flooding. It is not unusual for water to cover these roads several times each year, requiring the use of barricades to warn motorists.

NWS La Crosse Service Hydrologist Mike Welvaert (continued on p. 3)



260th Street, Chickasaw County, IA

Working With (and Appreciating) Our Volunteers

The La Crosse National Weather Service (NWS) relies heavily on a broad base of volunteers that provide supplementary weather information. This real-time and climate-related weather data is critical for forecast and warning operations. Our volunteers may not always realize it, but they are an essential part of our mission and the ultimate success of our efforts to protect life and property.

One of our more visible groups of volunteers are **Storm Spotters**. This is also known as the SKYWARN program. Storm spotters groups often



Skywarn spotters are a critical part of the real time ground truth verification process.

consist of volunteer fire department personnel, amateur radio operators, and others from the general public. They use their weather training to watch for significant weather, with the intent to provide "ground truth" to the NWS through their reports. They work long, late night hours at times, and often have to be out in the same weather from which they are trying to protect others. Their reports often alert us to developing severe weather or confirm a threat that can lead to better warnings and services. Storm spotter reports have saved lives, proving how valuable spotters are to the NWS and their local community.

"Our volunteers are an essential part of our mission."

There are approximately 2000 trained storm spotters in our area. Spotter training is conducted each spring (March through April) and is free to everyone.

Another group of volunteers with whom we work are **snow observers**. Most of the observers provide snowfall readings from their home residence during and after winter storms, often at all times of the day. The measurements not only allow our meteorolo-



Proof positive that our volunteer snowfall observers enjoy their role.

gists to track forecasts more closely and make important adjustments, if needed, but also provide information to the general public and media regarding how much snow actually fell in their area. This task can get challenging at times, especially during windy scenarios where blowing and drifting snow can make it very difficult to accurately measure the new snowfall.

We very much appreciate *all* of our volunteer observers. They are an essential part of our mission, and help ensure we provide the best service we can!

Infusing New Technologies into the Forecast Process

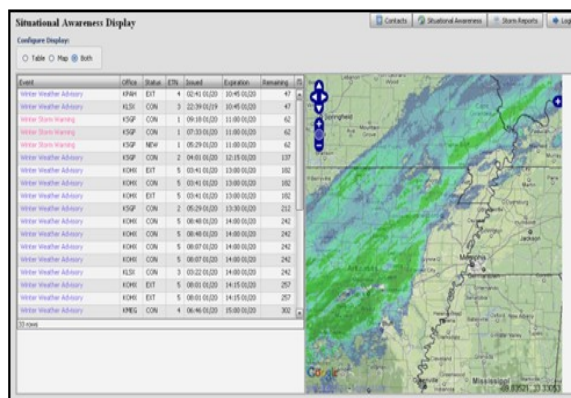
The La Crosse NWS Office has a long history of technical innovation as it applies to the forecast process and the service we provide. This innovation includes various web-based interfaces for use by our partners (including EMNotify and the Spotter Activation Notification System, among others). We continue to combine our operational knowledge of the weather with technical expertise to create and improve our forecast and warning tools.

Most recently, the NWS La Crosse has been actively participating in the Iris Project, a collaborative effort among a number of NWS offices, to develop web-based tools that allow for advanced decision support capabilities and fully integrate Geographic Information System (GIS) technology. One of these tools will allow us to easily catalog all of our users and their contact information in one place, along with any specific weather or hydro-

logical events that are important to them (such as temperatures below a certain threshold, or river stages above a certain level). By creating this "impact catalog", and being able to quickly search for users affected by weather and water phenomena, we will ultimately be able to provide more proactive service to our customers.

Other tools within the Iris Project include a Weather Event Reporting System and a Situational Awareness Monitor. The Weather Event Reporting System will allow us to quickly locate critical weather events when reported from observers on the ground, while also providing tools to reference radar imagery, search for addresses and businesses, and issue reports of dangerous weather events in a variety of formats. The Situational Awareness Monitor enables access to a

GIS display of radar imagery, warnings, and weather reports, which can be made available in large screen format for operational use. This will provide real-time awareness of the state of all warnings, events, and weather concerns occurring across the area in one concise glance — a real help in the busy severe weather forecasting environment.



A screenshot example of the Iris Situational Awareness Monitor.

Decision Support Service Through Pre-Event Collaboration

Decision support to key partner groups is an important focus for the modern National Weather Service. Combine this with new technologies and you develop an exciting time for collaboration that ideally provides those in decision-making roles the latest information and predictions they need.

The La Crosse NWS has been increasing these efforts and takes a proactive approach



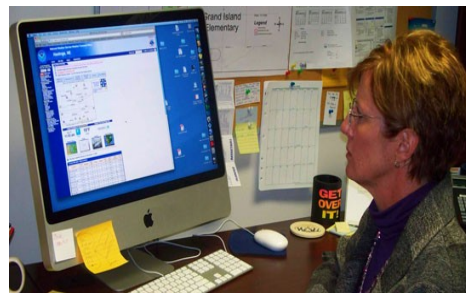
Pre-event collaboration with Emergency Managers and Emergency Operations Centers is a key element of preparedness for many emergency planning personnel.

preceding impactful weather. In recent years, we have enhanced use of local Hazardous Weather Outlooks, created a system that recommends storm spotter activation, introduced Internet chat, and developed an interface where recently-issued information can be reviewed for specific counties.

Webinars (multi-media briefings via the internet) have become the latest tool allowing forecasters to explain *graphically and visually* how weather may impact the area. This interactive approach allows for flexibility and opportunity to directly answer questions from our key partners without everyone involved having to physically meet.

Each webinar can be adjusted for the threat and provides a thorough, yet brief overview of what to expect. Comments regarding the webinars have included:

"The webinars are very useful!" (Floyd County, IA Emergency



NWS pre-event webinars provide excellent opportunities to view and discuss the potential for various solutions, enhancing Emergency Management planning processes.

Management), and "The information you provided was very timely and to be quite honest, I don't think any of us could have planned for it at all without your office's assistance." (Dodge County, MN Emergency Management).

We hope to continue improving the utility of the information we provide through these webinars into the future!

Testing the Future of Flood Forecasting

The La Crosse NWS office has become a part of a national test involving a handful of offices around the country who are testing a new river forecasting computer model. The office is working to implement this new computer simulation, called

KINEROS, on the upper portions of the Kickapoo River basin in an effort to better understand how rainfall and runoff affect river levels.

Work done during the past year will allow

us to test this new model's capability to predict flooding in the upper portion of the Kickapoo basin this coming year. If successful, we hope to be able to expand its use elsewhere across the region. Initial results look promising.

Turn Around - Don't Drown (continued from page 1)

notes that many local officials are very interested and eager to post these signs. Mike assisted with the installation of the northeast Iowa signs, and noted that one passing motorist stopped to thank them for putting up the signs.

"It takes only 6 inches of moving water on a road for a motorist to lose control of his vehicle."

These TADD signs are a part of a proactive effort by the NWS to limit the number of lives lost due to drowning through our "Turn Around Don't Drown" awareness campaign. These real-time reminders at critical locations are a key part of that effort.

At one location with new TADD signs, the roadway is actually designed to allow water to pass over the top of it. Having a TADD sign there is important to help alert motorists of this possible danger during high water events.

Flooding is still the number one severe weather killer. Since 1940, an annual average of 104 U.S. residents have drowned in flood waters. A majority of these flood deaths are vehicle-related. It only takes six inches of moving water on a road for a motorist to lose control of their vehicle, including SUVs. Two feet of moving water will carry most vehicles away.

If you encounter water over the roadway, it may be tempting to cross. But take the



Service Hydrologist Mike Welvaert (left) with public works and county officials at the posting of the TADD warning sign.

extra time to go around. That decision may save your life. Remember, "Turn Around, Don't Drown."

Flooding Sparks Installation of New River Gauge Sites

Significant flooding has resulted in a great deal of damage across the region in recent years. 2010 was no exception. To help communities prepare for flood events, your National Weather Service continues its efforts to provide more advanced notice of flooding, and educates our public users on issues related to flood hazard mitigation and safety.

"...these gauges will not stop future floods, but will certainly help us identify and predict how much water is coming and when it will arrive.."

One of the key components to the NWS's ability to forecast river levels and predict the magnitude of flooding is the availability of river level measurements. We have a number of automated monitoring gauges scattered across the area, as well as some gauges where levels are obtained and reported manually by volunteer observers.

With all the major flooding in recent years, federal and state funding programs have contributed to the installation of several new river and rainfall monitoring stations across the region. In the State of Iowa, the DNR installed ten new gauges statewide, and three of those were installed within the La Crosse hydrologic service area.

A separate grant obtained by the Iowa Flood Center and the University of Iowa allowed those groups to build and install fifty new river gauges statewide. Ten to fifteen of these will be installed in northeast Iowa. In addition, Floyd County, Iowa, used some local and county funding resources to install their own network of three river and rainfall gauges.

In Minnesota, the DNR is working with county officials to install about a dozen new monitoring stations across



One of the new Iowa Flood Center sonar gauges.

the southeast quarter of the state this coming summer. And in Wisconsin, Trempealeau County is working with state officials and the NWS to implement a new network of warning gauges this coming year as well.

These new gauges may not stop future floods, but they will certainly help us identify and predict how much water is coming, and when it will arrive. This, in turn, will help planners and decision-makers with real-time safety and community preparedness activities for any future floods that occur. And, of course, that is the real value of the technology and information: saving lives and protecting property!

Snow Accumulation: Applying New Local Research to Forecast Operations

In last year's Shareholder Report, we discussed the physics of ice crystals growing in an environment of abundant water vapor and temperatures between 0°F and 10°F. These crystals, called stellar dendrites, can produce 25 to 30 inches of snow for every one inch of liquid water used to build them. In other temperature/water vapor regimes, ice crystals grow in the form of needles or columns. The most common ice crystal or snowflake is a combination of many types and only produces about 12 inches of snow for every one inch of water used to create them. As ice crystals fall from their creation level above the surface, they may encounter any number of temperature and moisture environments.

In research conducted over the past year, high snow, low water content storms were investigated for their temperature, moisture, and wind environments. The hypothesis was that the regimes that favor stellar dendrites (e.g., temperatures in the 0-10°F range) must exist for some greater depth above the surface. Thus, most of the crystals reaching the surface would be in the form of stellar dendrites - with little

"dilution" of the other, less-fluffy crystal types that would grow outside the magic 0-10°F range.

"This research is now a part of our forecast operations...to provide better snowfall estimates to the public and emergency managers."



Light, fluffy, "dendritic" snow can accumulate faster with less total water content.

Our research reviewed 12 high snow, low water content storms, which indeed revealed considerable depth to the 0-10°F temperature range. Of particular interest was the depth to which this temperature range existed: from just above the surface to nearly 15,000 feet! The logical scientific assumption is that while some ice crystals formed above 15,000 feet in the cloud-bearing layer, most of the crystals for these storms formed in that all-important layer of stellar dendrite growth.

This research is now part of our forecast operations. If we identify very deep layers with 0-10°F temperature and ample moisture, we expect lighter, fluffy snows where totals could reach 25 inches for every one inch of liquid water. This recognition allows the NWS La Crosse to not only provide better snowfall estimates to the public and emergency managers, but provide snow type information (e.g., "heavy", "fluffy") to transportation customers.

Serving our Community

During 2010, the La Crosse NWS staff, along with their family members, reached out to help others in the community in a variety of ways. These activities were organized by the office leadership team. Included in these community projects were the following:

- Support to the Hunger Task Force, which serves various food pantries in the La Crosse area. We participated in the following areas:
 - WAFER Food Shelf. Our office has provided assistance at the Food Shelf on 12 different occasions this past year.
 - La Crosse Community Garden. Members of the office staff (along with their family members) assisted during a number of scheduled work events at the garden.
 - "Stuff the Bus" food drive. In association with the La Crosse Spartans indoor football team, the office held a food drive to support this project.

- Big Brothers/Big Sisters. After raising around \$2000 this year, the office has now raised over \$17,000 the past 12 years in association with their annual "Bowl For Kids Sake" fundraiser.
- School Supplies. Three 20-gallon totes of school supplies were donated to the different school districts in the area to assist area educational programs.
- New Horizons Women's Shelter. As a Christmas project, the office staff donated a variety of items of need to the shelter, with a focus on winter weather clothing.
- La Crosse Family and Children's Center. The office collected gifts for a needy family at Christmas time, including household items and gifts for the children.

In our service-oriented agency, we are keenly aware of the impact we all can

have on the lives of others living in our community. We are grateful for the opportunity we have had to serve (and learn from) others in these varying capacities during the past year, and hope that our personal impact on our community and those around us goes beyond what we contribute through our vocational efforts!



NWS staff members David Schwemlein and Jeff Raberding (2nd and 3rd from left) assist at the "Stuff the Bus" event in downtown La Crosse.

Awards, Recognition and Personnel Changes

Once again, 2010 was a year of accomplishment and innovation by NWS La Crosse personnel. In addition to the high quality day-to-day forecast and warning information provided by our office team, specific staff members have been recognized for improvements in various local, regional and national program areas.

"For the 8th year in a row, the NWS La Crosse was recognized by having at least one of its employees selected as an NWS Central Region Cline Award winner."

The NWS Cline Award is the highest regional and national award conferred by the NWS. Local La Crosse nominees contend for Regional Cline Awards against nominees from 39 other regional forecast offices and regional office personnel. For the 8th year in a row, the NWS La Crosse office was recognized by having at least one of its employees selected as an NWS Central Region Cline Award winner.

NWS La Crosse staff members have now received 12 Regional Cline Awards (to 9 different individuals) in the past 8 years! This consistent recognition bestowed on the local staff reflects the high quality and innovative work performed by many of the staff members, along with the regional and national respect garnered for those efforts.

This year, Lead Forecaster Andy Just received the Regional Cline Award in the area of "Hydrometeorology". Andy's contributions and innovation also won the National Cline Award, the second time in 6 years our office has had a national winner!

Additionally, Service Hydrologist Mike Welvaert received the Regional Cline Award in the area of "Hydrology" this year. We're proud to have Andy and Mike on our team, and of the recognition they received for their excellent efforts!

We're also proud that two of our staff employees were promoted within this past year: Forecaster Todd Rieck to Lead Forecaster, and Meteorologist Intern Jessica Brooks to Forecaster at the NWS office in North Platte, NE.

With the retirement of two additional employees during the past year, we have welcomed two new staff members to our team. John Wetenkamp is our newest Forecaster, promoted from the NWS Rapid City office and, most recently, Jamie Gibbons joined our office team as Administrative Support Assistant. Jamie was previously an Administrative Assistant with the U.S. Army Corps of Engineers. We are pleased to add these talented individuals to our staff! If you see or talk to John or Jamie, be sure to give them a special welcome to the local area!



Service Hydrologist Mike Welvaert (left) and Lead Forecaster Andy Just (right) with their 2010 Regional Cline Awards



New Staff Members:
Administrative Support Assistant
Jamie Gibbons and Forecaster
John Wetenkamp

National Weather Service
La Crosse, WI

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<http://weather.gov/lacrosse>

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Our Mission Statement

National Weather Service Mission

"Provide weather, hydrologic and climate forecasts and warnings... for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by others in the global community."

NWS La Crosse Mission Statement

"Dedicated to continuous improvement in the provision of high quality weather-related warning, forecast and educational information for the safety and overall benefit of the citizens we serve."

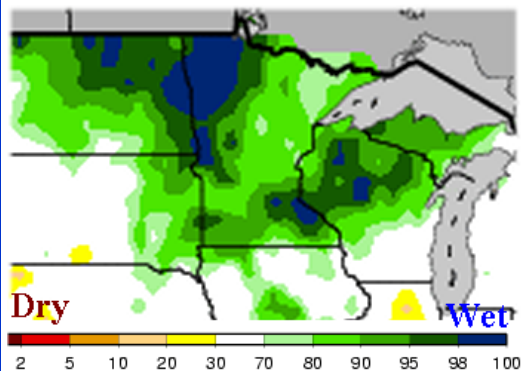
Wet Period Leads to Spring Flooding Concerns

During the latter half of 2010, the North Central states experienced well above-normal precipitation. Minnesota had its second-wettest July through December in recorded history, averaging 7.66 inches above the 1901-2000 mean. Similarly, Wisconsin averaged 7.03 inches above its 1901-2000 mean — its third wettest July through December in recorded history.

This precipitation has kept the soils very wet in the tributaries which feed the Mississippi River — not only locally, but also in the Chippewa, Minnesota, and St. Croix river basins which drain into Mississippi River north of the La Crosse forecast area.

"The Mississippi River may see some of its highest water levels in years."

Soil moisture estimates from the University of Washington (below) estimate that the soil moisture contains over 90 percent of what they can hold in these basins; therefore, only a small percentage of the spring snow melt can be absorbed

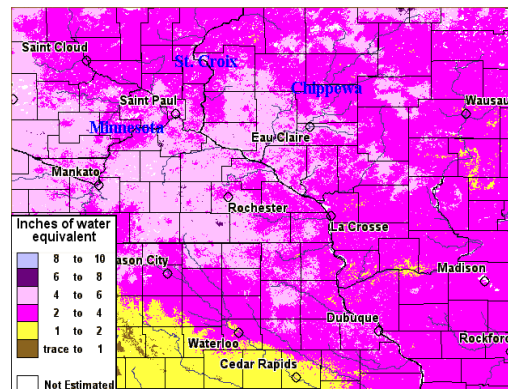


Soil moisture percentages in early February, 2011.

by the soils. As a result, much of the water from melting snow in the Mississippi River tributaries north of La Crosse is expected to flow into the river system.

In addition to the generally wet soils, liquid water in the snowpack through the same river basin area is also running higher than normal as we head into the spring melt season. In early February, water amounts in the snowpack were commonly in the 3 to 5 inches range in the Chippewa, Minnesota, and St. Croix river basins. With the soils already wet, much of this water will likely end up flowing into the Mississippi River.

The amount of additional snow that falls - and how rapidly the snow melts - will be critical influences on how significant the flooding could be this spring. If we remain colder than normal through March, the existing snow pack would last longer into the spring. The longer the snowpack lasts, the higher the probability of a quick melt. A

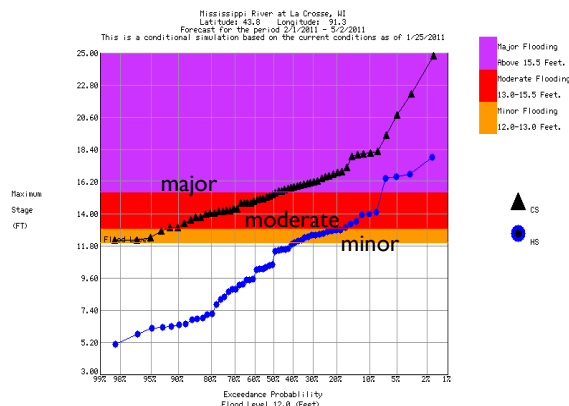


Soil water equivalent in early February 2011.

later melt season also raises the potential for additional runoff from heavy rainfall as the snow melts.

Considering all of these factors, the chances for flooding are above to much-above average this year. The latest Spring Snowmelt Flood Potential Outlook issued by our office indicates that flooding potential is as much as 50 to 70 percent greater than in an average year. While tributary flooding is also a concern, the Mississippi River itself may see some of its highest water levels since 2001.

The image below is from our Advanced Hydrologic Prediction Service (AHPS) web page. It indicates the probability for Mississippi River flooding at La Crosse, WI. The blue (lower) line is the probability for flooding in a normal year, based on about 60 years of history. The black (upper) line is the "conditional" probability for flooding, based on current soil conditions, snowpack, and expected temperatures and precipitation. This figure shows that the flooding potential is much greater than normal this year. Most other locations along the Mississippi River, as well as some of its tributaries, show a similar scenario. Updates to our Spring Flood Outlook will be issued through early March. Residents with concerns about flooding will want to pay close attention to these updates.



Historical crest probabilities (blue) and conditional exceedence probability (black) for the Mississippi River at La Crosse from February 1, 2011 through May 2, 2011.